

REMARKS

The issues outstanding in the Office Action mailed March 1, 2004, are the objection to the specification and the rejection under 35 U.S.C §103. Reconsideration of these issues, in view of the following discussion, is respectfully requested.

Objection to Specification

The subheading "Brief Description of the Drawings" has been added to the specification, to identify the brief description alleged to be missing. Moreover, the reference to "Figure 5" has been corrected to indicate that it is Figures 5 A and B that is meant. As such, it is submitted that the objection should be withdrawn.

Rejection Under 35 U.S.C §103

Claims 1, 6, 7, 15-22, 24 and 25 have been rejected over Förster et al. '104. It is noted that claim 23 has *not* been rejected over art. Reconsideration of the rejection is respectfully requested.

Förster discloses a method for producing a homogenous *gas* mixture, from *two gas streams* of different parameters. See column 1, lines 8-11. Thus, as admitted at page 3 of the Office Action, the reference does not "disclose the state of each of the fluids." Contrary to the indication in the Office Action, however, the recitation of fluid types such as liquid or gas is *not* mere "recitation of the intended use of the claimed device". The claim recites a chamber "supplied with a liquid first fluid" and a series of tubes "supplied with an essentially gaseous second fluid." This is not an intended use, but a positive recitation of the presence of liquid and gas. Thus, the reference would not be looked to for teachings relevant to the present invention. It is well known that the technical problems involved in gas liquid mixing ("polyphasic" mixing) are considerably different from those involved in gas/gas mixing ("monophasic" mixing), e.g., due to the very different specific gravities of the materials employed. Thus, one of ordinary skill in the art would not look to a reference dealing with gas/gas mixing for applicability to a

gas/liquid environment. The standard for determining whether a reference represents analogous art was set forth in *In re Clay*, 966 F.2d 626, 23U.S.P.Q.2d, 1058 (Fed. Cir. 1992). In *Clay*, the Federal Circuit held it was first necessary to determine whether the reference is directed to the same technical area. Here, in view of the different feeds employed and different processes conducted in the reactor of the reference and that of the claims, it can be seen that a different technical area is involved. Next, the *Clay* court indicated that it is necessary to inquire whether the reference addresses the same problem as that of the invention. Again, as noted above, this is not the case inasmuch as the problems associated with polyphasic mixing are considerably different from those of monophasic mixing. Accordingly, it is submitted that the reference is non-analogous. As a result, it is submitted that claim 1 and its dependents, which recite the supply of liquid first fluid and of an essentially gaseous second fluid, are not suggested by the reference. This is even more so the case with claims 27 and 28, wherein the liquid first fluid consists essentially of hydrocarbons and the essentially gaseous second fluid is hydrogen.

Moreover, even if one of ordinary skill in the art were to consider the disclosure of Förster as being relevant to the present invention, patentees do not teach a device as presently claimed in claims 18, 26 and independent claim 30, particularly since Förster teaches placing the device *between* two catalytic layers where the reaction stream crosses tubes vertically or axially through several parallel mixing tubes. For example, see Figure 1 in which the reaction stream flows through catalyst bed (1), through *essential* free space (2), into mixing path (3) in tubes (9), then through distribution space (5) and into downstream catalyst layer (6). See also the description in the reference at column 3, lines 4-25. Quench gas is admitted into the tubes through holes. Thus, the reference fails to suggest gas liquid distribution, at the head of a reactor, e.g., used a hydrocracking, hydrotreatment, hydrodesulphurization or selective hydrogenation reactor, for example. There is no motivation for one of ordinary skill in the art to move the mixing apparatus to the head of the reactor or *upstream* of the catalyst bed, thus essentially rendering unsuitable for Förster's use the construction wherein the mixing apparatus is between catalyst beds.

Instead, even if one of ordinary skill in the art were to view Förster as relevant to the presently claimed art area, Förster's teaching would result in passing the main reacting stream

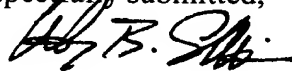
(hydrocarbon liquid feed stock to be hydrocracked, hydrotreated, hydrodesulphurised or selectively hydrogenated) axially along the reactor and then through inlets of parallel tubes, and to introduce hydrogen containing gas into the box/reaction change in place of the quench gas of Förster, thus entering the tubes from the outside through holes. This would result in the upstream "open space" indicated as important in Förster. However, the present claims noted above are directed to a device wherein the main reacting stream (first fluid) is introduced into the chamber *outside* of tubes or conduits (108) traversing the chamber and the second fluid (hydrogen gas for example) enters directly into the tubes through the tube inlets and the "series of tubes or conduits...supplied with a second fluid...". As a result, Förster does not suggest a construction such as that of claim 1 and its dependents wherein the first fluid is external to the tubes and the second fluid supplied directly to the tubes, much less such a construction as in claims 18 and independent claim 30, among others, wherein the device is located at the reactor head or upstream of a catalyst bed.

Accordingly, the reference completely fails to suggest the presently claimed device, and withdrawal of the rejection under 35 U.S.C §103 is respectfully requested.

The claims of the application are submitted to be in condition for allowance. However, if the Examiner has any questions or comments, he or she is cordially invited to telephone the undersigned at the number below.

The Commissioner is hereby authorized to charge any fees associated with this response or credit any overpayment to Deposit Account No. 13-3402.

Respectfully submitted,



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June 1, 2004

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Re: U.S. Patent Application Serial No.09/930,201
**DISTRIBUTION DEVICE FOR PRODUCING A POLYPHASE
MIXTURE, AND ASSOCIATED REACTOR**
Your Ref: 4695/00/ -FA
Our File: PET 1945

Dear Mr. Lenglet:

Thank you for your telefax of May 12, 2004. We have departed slightly from your instructions in our structuring of the claims, in view of considerations of U.S. law. In the U.S., recitations of intended use, for example, that the chambers be supplied with liquid and gas, do not impart patentability to an apparatus claim which is considered to be directed to the apparatus itself, apart from its use. Thus, in order to base patentability on the use of liquid and gas polyphasic mixing, we have to physically require the fluids, as we have more or less a one in claim 1. However, in order to explore in more detail exactly what features the Examiner would find patentable, we divided the claims up as follows:

✓
Claim 1 - liquid and gas mixing. The disadvantage being that, in order to infringe this claim, the apparatus will actually have to be used in this manner: if party A constructs the apparatus but does not use it, and party B purchases the apparatus and uses it, only party B will be liable for infringement. Moreover, it is not until the apparatus is put into use before even party B could be stopped;

Claim 18 - dependent on claim 1, also requiring location of the device upstream of the catalytic bed or reactor head;

Claim 26 - dependent on claims 1 and 18, further specifying that the device is upstream of the head of hydrocracking, hydrotreatment, hydrodesulfurization or selective hydrogenation reactor;

Claim 27 - dependent upon claim 1, specifying that the first liquid fluid is hydrocarbons, and the second gaseous fluid is hydrogen;

Claim 28 - dependent on 26, 18 and 1, requiring hydrocarbons, hydrogen, and location upstream of the various hydro processing reactors;

Claim 29 - essentially the claim requested in your letter, reciting all of the features of the liquid and gas, location of the device in independent form; and

Independent Claim 30 - not requiring the liquid and gas polyphasic mixture as in claim 1, but requiring the location upstream or at the reactor head. It is our hope that, depending upon the Examiner's reaction to these various claims, we will be able to determine the broadest allowable claim.

Finally, we apologize for the confusing surrounding the reference numbers and priorities of those applications. It appears that the texts were physically switched before filing. In order to correct the priority claims, we will need new certified copies of the priority documents, for which bother we again apologize.

Please let us know if you have any questions.

Very truly yours,

Harry B. Shubin 